Forest Insect Conditions
on the Dixie National Forest
and in Bryce Canyon National Park
1969

The following is a discussion of the most important forest insect problem on the Forest and in the Park during 1969--the mountain pine beetle. Other less serious insect problems that are maintaining a more or less endemic status were discussed in our July 28 memorandum to Park Superindentent Heyder. Of these, the most significant finding was the discovery of the spruce budworm (western form), Choristoneura occidentalis Free. on white fir in the Park. The location of most of these insect problems are shown on the aerial survey map which was mailed earlier. A more complete discussion of the mountain pine beetle problem follows:

Mountain pine beetle, Dendroctonus ponderosae Hopk.

Bryce Canyon National Park and the East Fork of the Sevier River, Dixie National Forest, have a long history of mountain pine beetle outbreaks in ponderosa pine. As early as the early 40's, and even before, sporadic outbreaks have been met with control action. Later, during the period 1951 through 1961, more than 45,000 trees were treated by a variety of methods, including fall and burn, fall and spray, and logging for salvage.

The present outbreak began in 1966 and continues to the present. Figure 1 in the Appendix shows the trend of the infestation for this period, 1966-69, as mapped during the aerial survey. At this time, the infestation is centered on Whiteman Bench and in Ingram Hollow on the Forest and in the Park. The heaviest single concentration of beetle damage is in the Park and is quite noticeable from the main highway (Figures 2-4).

Since it was felt that the infestation had reached concernful proportions, an extensive ground survey was conducted by Park and Forest Service personnel, during October 13-16, to determine the intensity and trend of the infestation. Those participating in the survey were:

Ron Beebe	Dixie National Forest
Bruce Fladmark	Bryce Canyon Park
Gerald Hoddenbach	Bryce Canyon Park
David Jones	Zion National Park
William Klein	U. S. Forest Service, Ogden
Jake Metherell	N.P.S. Cedar City
Virgil Olson	Bryce Canyon Park
Douglas Parker	U. S. Forest Service, Ogden
Shag Taynton	U. S. Forest Service, Ogden
Ron Trussel	Bryce Canyon Park

Since it was already known that the 1968 attacks (faders) were relatively light and widely scattered over a large area, the cruise was designed in a systematic, random manner. The cruise area of approximately 10,000 acres (Figure 5) was delimited and traversed by transects running east and west, 10 chains apart. On each transect, variable half plots (BAF 10) were established at 10 chain intervals, resulting in a grid pattern

10 chains square. The area was further divided into 5 zones, each zone being assigned to a two-man crew. Starting points for each zone were located on aerial photographs and marked on the ground.

The number of old (1968) and new (1969) attacks on trees 6" d.b.h. and up were recorded by 2-inch diameter class on each plot (Figure 6). A total of 720 (half) plots were sampled. The number of attacked trees by year and diameter class per acre follows:

Year of Attack	DBH 6	8	10	12	14	16	1	20	22	24 +	2	Total*
1968	0	.08	0	.11	.03	.08	.05	.06	.01	.06	.02	.50
1969	0	.08	.10	.14	.08	.04	.05	.01	.02	0	.03	.55

It is interesting to note that this data is based on only 50 trees (22 new and 28 old) for that was the total tree count for the survey. These 50 trees were recorded on 36 plots, with no entries made on the remaining 684 plots. The most trees recorded on any single plot was 3. The reason that there are more new attacks per acre than old attacks per acre, when the actual counts (22 vs 28) shows the reverse, is that most of the new attacks are in the smaller diameter classes which are represented with larger conversion factors. However, the counts are so low, and there was such an excess of zero counts, that little credence can be put on the reliability of the cruise data (SE 205%), other than (1) the infestation is relatively light and (2) there is little indication of a significant increase in tree mortality during 1969.

From this data and from additional firsthand observations made in portions of the affected area during summer and fall, tree killing should remain about the same in 1970 with little change in infestation boundaries. Group killing of noticeable proportions will continue to show up on both sides of the highway in the Park. Widely scattered mortality will occur on the west side of the Sevier River in the Forest but well under that experienced in 1968.

In other areas of the Forest and Park, the mountain pine beetle in ponderosa pine is at a low level.

Control, in the form of individual tree treatment, is not recommended at this time. Past experience has shown that at best, individual tree control over extensive areas only prolongs the eventual. If specific areas are to be harvested in one or two years, and the cost of treatment can be justified, then some momentary protection can be obtained. This would entail not only treatment of the specific area, however, but treatment of a relatively large buffer zone as well. The most practical solution, considering all multiple use aspects, is to gear timber management plans to the orderly removal of susceptible ponderosa pine type on Whiteman Bench and in the lower reaches of the East Fork of the Sevier.

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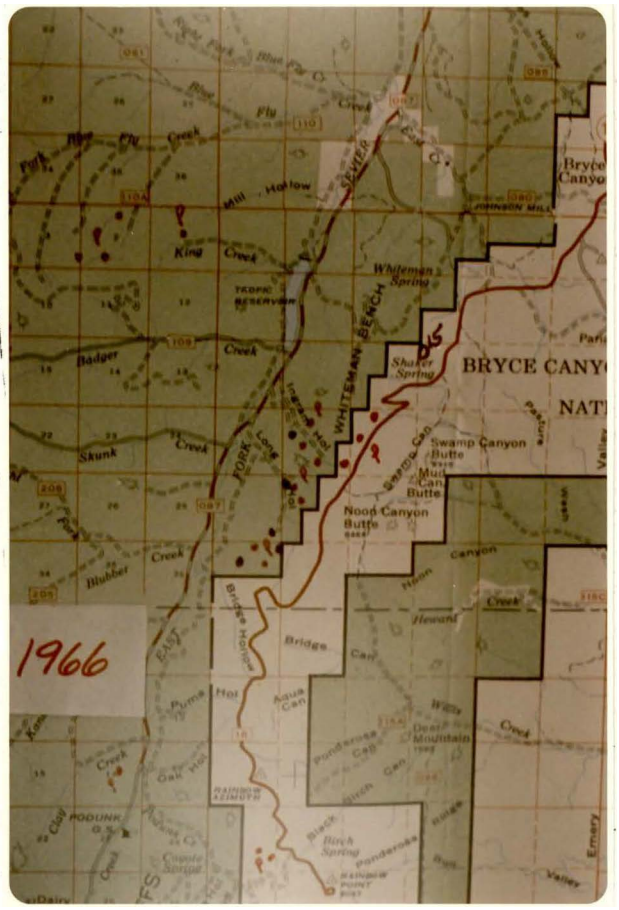
Some tree protection can be obtained in King Creek Campground and in other high use areas of the Forest and Park by treating desirable trees with a preventive spray just prior to beetle flight next summer. Information concerning the application and timing of preventive sprays will be sent on request.

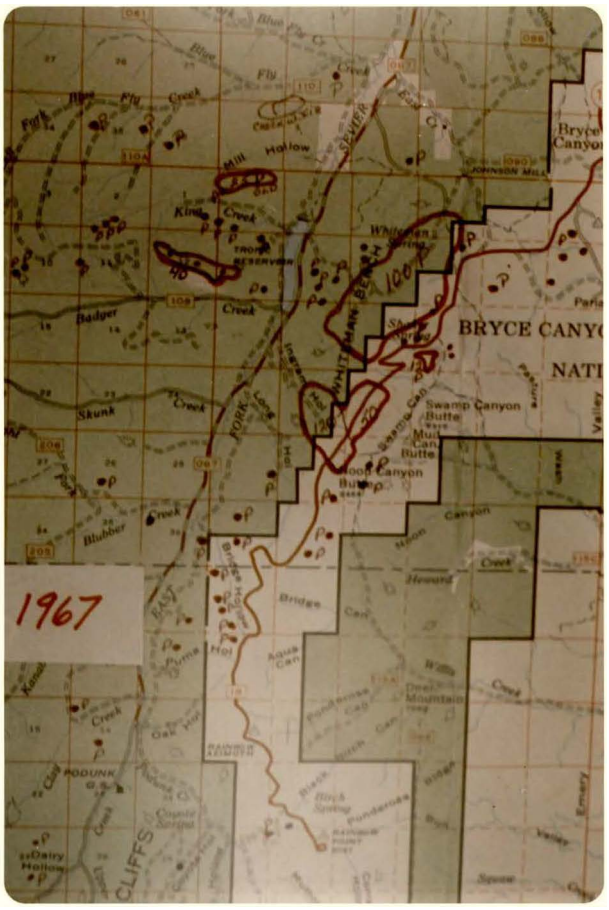
William H. Klein

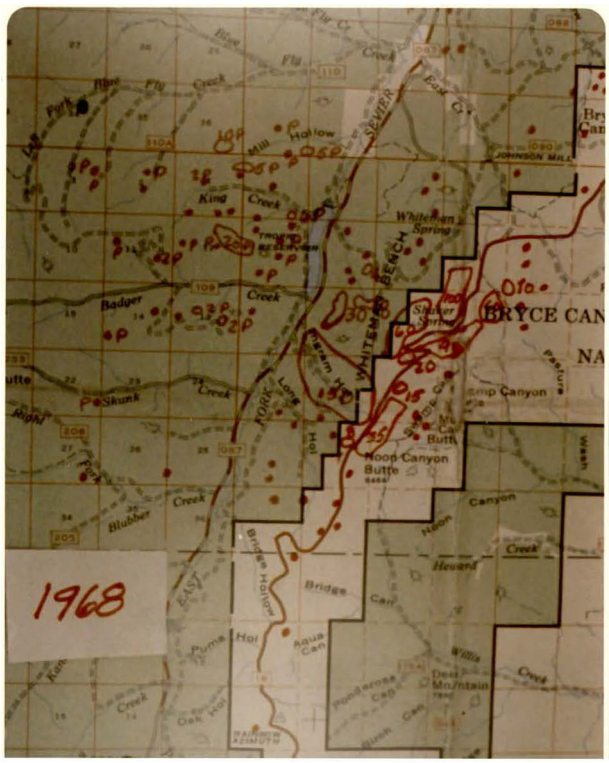
WILLIAM H. KLEIN
Entomologist

cc:
Dixie N.F.
Powell R. D.
Bryce Canyon National Park

Figure 1. Trend of the mountain pine beetle, Dendroctonus ponderosae Hopk. in ponderosa pine in Bryce Canyon National Park and in a portion of the Dixie National Forest, 1966 to 1969, as determined by aerial surveys.







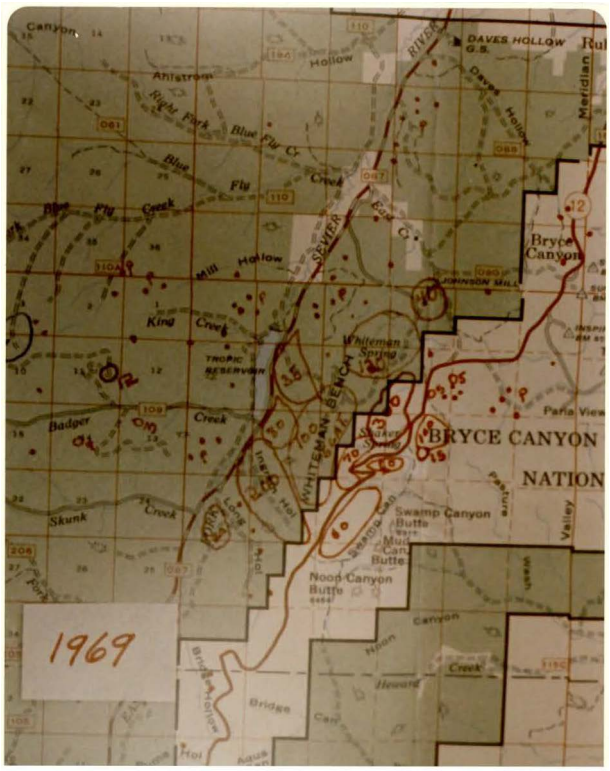


Figure 2. Stereograph of beetle infestation north of switchback in Bryce Canyon Park. Swamp Canyon in upper left. Ektachrome-X

Figure 3. Stereograph of beetle infestation south of Whiteman Spring area. Ektachrome-X

Figure 4. Stereograph of beetle infestation near Shaker Springs. Whiteman Bench in background. Many of the grey snags are Douglas-fir killed by the Douglas-fir beetle. Ektachrome-X

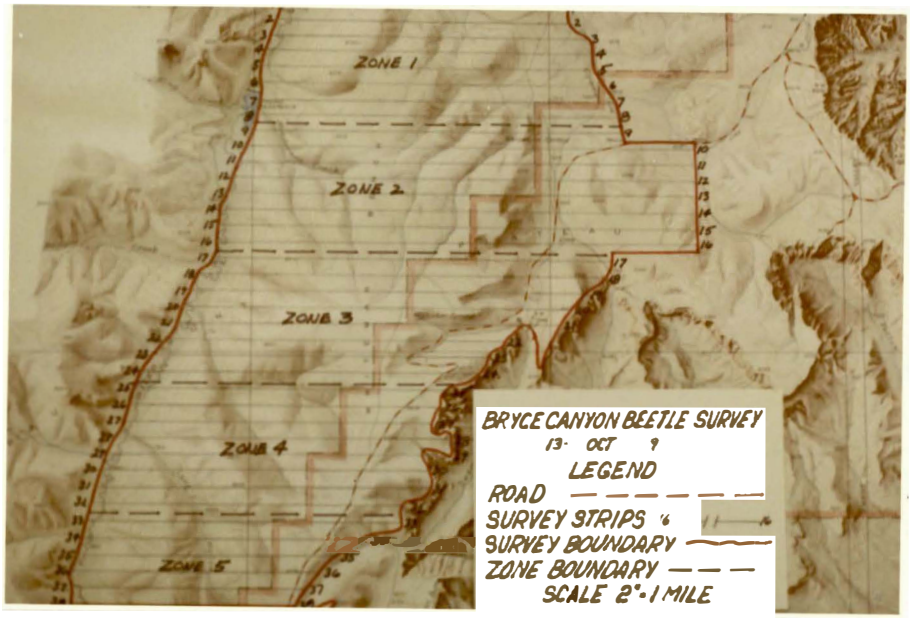
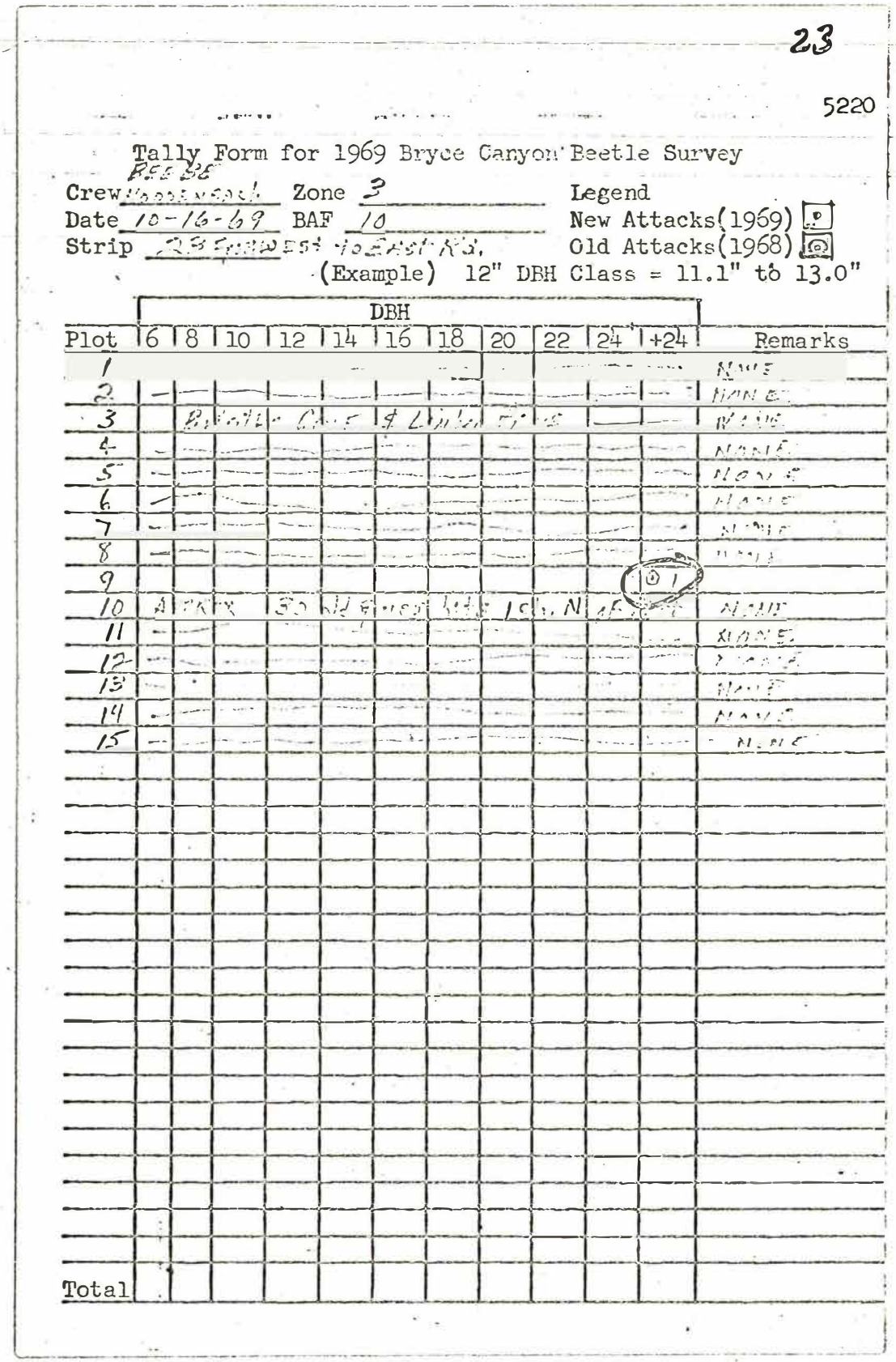


Figure 5. The cruise area.

Figure 6. Example of tally form used during the survey.



23

5220

Tally Form for 1969 Bryce Canyon Beetle Survey

Crew [illegible] Zone 3 Legend

Date 10-16-69 BAF 10 New Attacks(1969) ⊙

Strip [illegible] Old Attacks(1968) ◎

(Example) 12" DBH Class = 11.1" to 13.0"

	DBH											
Plot	6	8	10	12	14	16	18	20	22	24	+24	Remarks
1												NONE
2	—	—	—	—	—	—	—	—	—	—	—	NONE
3		Beetle Case # Limber Pine										NONE
4	—	—	—	—	—	—	—	—	—	—	—	NONE
5	—	—	—	—	—	—	—	—	—	—	—	NONE
6	—	—	—	—	—	—	—	—	—	—	—	NONE
7	—	—	—	—	—	—	—	—	—	—	—	NONE
8	—	—	—	—	—	—	—	—	—	—	—	NONE
9											⊙ 1	
10	A [illegible]		30 [illegible]					1 Ch. N	[illegible]			NONE
11	—	—	—	—	—	—	—	—	—	—	—	NONE
12	—	—	—	—	—	—	—	—	—	—	—	NONE
13	—	—	—	—	—	—	—	—	—	—	—	NONE
14	—	—	—	—	—	—	—	—	—	—	—	NONE
15	—	—	—	—	—	—	—	—	—	—	—	NONE
Total												